

Appl. No. : 10/627,069
Filed : July 25, 2003

REMARKS

The foregoing amendments and the following remarks are responsive to the August 8, 2005 Office Action for the above-identified patent application. This Office Action is based on Claims 2, 6-9, 14-27, 31-32, and 35-65, which were previously pending. With this paper, Claims 35, 42-43, 48-49, and 65 are amended. Claims 2, 6-9, 14-27, 31-32, and 50-64 are canceled, without prejudice, and new Claims 66-112 are added. Accordingly, Claims 35-49 and 65-112 are presently pending.

Drawings and Specification

The drawings are objected to under 37 C.F.R. § 1.83(a) as not showing every feature of the inventions specified in the claims. In particular, the Office Action states that the drawings do not show the film of semiconductor material implanted with high-energy ions at a penetration depth, which differs from the penetration depth of optical signals reflected from the saturable absorber mirror. Applicants have included in Fig. 2a dashed curve 201a, which is a representation of the proton concentration as a function of depth obtained after proton implantation into a saturable semiconductor film illustrated in Fig. 3. Paragraph [0064] of the specification has been amended to refer to 201a. Support for the amendment is found at least in paragraphs [0060] to [0064] and Figs. 2a and 3. No new matter is added. Applicants respectfully request, therefore, that the objection to the drawings be withdrawn.

Rejection Under 35 U.S.C. § 102(e) Based on Kaneko

Claims 35-36 and 45-48 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. 2002/0105711 A1 to Kaneko. Applicants submit, however, that Claims 35-36 and 45-48, as amended, are patentable over Kaneko as Kaneko does not include each of the features recited in these claims.

For example, Claim 35 as amended recites a saturable absorber mirror for passive modelocking of lasers, comprising:

a film of a semiconductor material implanted with high energy ions at a penetration depth which differs from the penetration depth of optical signals reflected from said saturable absorber mirror, said semiconductor material having an ion implantation depth profile selected to provide saturable absorption having a multi-temporal carrier relaxation.

Appl. No. : 10/627,069
Filed : July 25, 2003

Kaneko, however, does not teach or suggest semiconductor material having an ion implantation depth profile selected to provide saturable absorption having a multi-temporal carrier relaxation in combination with the other limitations recited in Claim 35.

Claims 36 and 45-47 depend from independent Claim 35 and include the limitations of Claim 35 in combination with additional limitations. Applicants submit that the combination of limitations recited in Claim 36 and 45-47 is also not shown by Kaneko.

Additionally, Claim 48 as amended recites a saturable absorber mirror for passive modelocking of lasers, comprising

a film of a semiconductor material implanted with high energy ions at a penetration depth which is smaller than the penetration depth of optical signals reflected from said saturable absorber mirror, said high energy ions creating a first trap concentration at a first depth region and a second trap concentration at a second depth region such that said film exhibits saturable absorption governed by a fast time constant and a slow time constant.

Kaneko does not teach or suggest, for example, high energy ions creating a first trap concentration at a first depth region and a second trap concentration at a second depth region such that the film exhibits saturable absorption governed by a fast time constant and a slow time constant in combination with the other limitations recited in Claim 48.

Applicants respectfully submit that Claim 48 is patentably distinguished over Kaneko. Accordingly, Applicants respectfully request allowance of Claims 35, 36 and 45-48.

Rejection Under 35 U.S.C. § 102(e) Based on Hong

Claim 65 is rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. 2003/0147134 to Hong, et al. Applicants submit, however, that Hong does not teach each of the claimed features recited in Claim 65.

For example, Claim 65 as amended recites a saturable absorber for passive modelocking of lasers operating in the 1.0 – 1.1 um wavelength range, comprising:

a film of bulk InGaAsP or quantum wells fabricated with a bandgap in the 1.0 – 1.1 um wavelength region, said film implanted with high energy ions at a penetration depth which differs from the penetration depth of optical signals.

Hong does not teach or suggest at least a film implanted with high energy ions at a penetration depth which differs from the penetration depth of optical signals in combination with the other limitations recited in Claim 65.

Appl. No. : 10/627,069
Filed : July 25, 2003

Applicants respectfully submit that Claim 65 is patentably distinguished over Hong, and Applicants respectfully request allowance of Claim 65.

Rejection Under 35 U.S.C. § 102(b) Based on Yamazaki

Claim 49 is rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. 2001/0034089 to Yamazaki, et al. Yamazaki, however, does not disclose each of the features recited in Claim 49.

Claim 49 as amended recites a saturable absorber to be operated in transmission for passive modelocking of lasers, comprising:

a film of a semiconductor material implanted with high energy ions at a penetration depth which is smaller than the thickness of said film such that said film exhibits multi-temporal relaxation.

Yamazaki, however, does not teach or suggest, for example, a film that exhibits multi-temporal relaxation in combination with the other limitations recited in Claim 49.

Applicants respectfully submit that Claim 49 is patentably distinguished over Yamazaki, and Applicants respectfully request allowance of Claim 49.

Rejection Under 35 U.S.C. § 103(a) Based on Kaneko and Ooi

Claims 37-40 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kaneko in view of U.S. 2002/0072142 A1 to Ooi, et al. Applicants submit, however, that the combination of Kaneko and Ooi fails to disclose each of the limitations recited in Claim 37-40.

Dependent Claims 37-40 depend from independent Claim 35. Accordingly, Claims 37-40 include the limitations of Claim 35 in combination with additional limitations. As described, above, however, Kaneko does not teach or suggest, among other limitations, semiconductor material having an ion implantation depth profile selected to provide saturable absorption having a multi-temporal carrier relaxation as recited in amended Claim 35. Applicants respectfully assert that Ooi also fails to teach or suggest, among other limitations, semiconductor material having an ion implantation depth profile selected to provide saturable absorption having a multi-temporal carrier relaxation.

Accordingly, the proposed combination of Kaneko and Ooi does not teach or suggest the combination of claim features recited in Claims 37-40. For at least this reason, Applicants

Appl. No. : 10/627,069
Filed : July 25, 2003

respectfully assert that Claims 37-40 are patentable over the combination of Kaneko and Ooi, and Applicants respectfully request allowance of Claims 37-40.

Rejection Under 35 U.S.C. § 103(a) Based on Kaneko and Goedertier

Claim 41 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Kaneko in view of U.S. Patent No. 3,500,234 to Goedertier.

Claim 41, which depends from Claim 35, recites a saturable absorber mirror as defined in independent Claim 35, which claims one surface of the mirror is anti-reflection-coated in combination with additional limitations. As described above, Kaneko does not teach or suggest, among other limitations, semiconductor material having an ion implantation depth profile selected to provide saturable absorption having a multi-temporal carrier relaxation. Applicants respectfully assert that Goedertier also does not teach or suggest, among other limitations, semiconductor material having an ion implantation depth profile selected to provide saturable absorption having a multi-temporal carrier relaxation.

Accordingly, the proposed combination of Kaneko and Goedertier does not teach or suggest the combination of limitations recited in Claim 41. For at least this reason, Applicants respectfully assert that Claim 41 is patentable over the combination of Kaneko and Goedertier, and Applicants respectfully request allowance of Claim 41.

Allowable Subject Matter

Claims 42-44 are objected to as being dependent upon a rejected base claim. The Examiner states, however, that Claims 42-44 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Claims 42-43 have been rewritten herein as suggested by the Examiner. Claims 42-43, therefore, are in condition for allowance. Claim 44 depends from an allowable base claim. Applicants respectfully request that the objection to Claims 42-44 be withdrawn.

Conclusion

For the foregoing reasons, Applicants respectfully submit that the present application is in condition for allowance, and Applicants respectfully request that a Notice of Allowance be issued

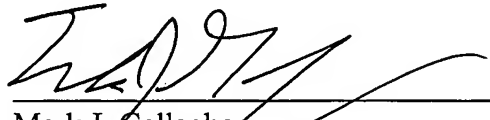
Appl. No. : 10/627,069
Filed : July 25, 2003

at the earliest opportunity. Should there be any questions or issues that may be resolved by a telephone interview, Applicants respectfully invite the Examiner to call the undersigned attorney of record at the general office telephone number listed below.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 12/8/05

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Appl. No. : 10/627,069
Filed : July 25, 2003



APPENDIX

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Appl. No. : **10/627,069**
Filed : **July 25, 2003**

AMENDMENTS TO THE DRAWINGS

One Replacement Sheet of drawings that includes a change to Fig. 2a is provided in the Appendix of this paper. This sheet, which includes Figs. 2a and 2b, replaces the original sheet including Figs. 2a and 2b. Also provided in the Appendix is one Annotated Sheet Showing Changes.



POLARIZATION MAINTAINING DISPERSION CONTROLLED
FIBER LASER SOURCE OF ULTRASHORT PULSES

Martin E. Fermann

Appl. No.: 10/627,069 Atty Docket: IMRAA.021A
ANNOTATED SHEET SHOWING CHANGES

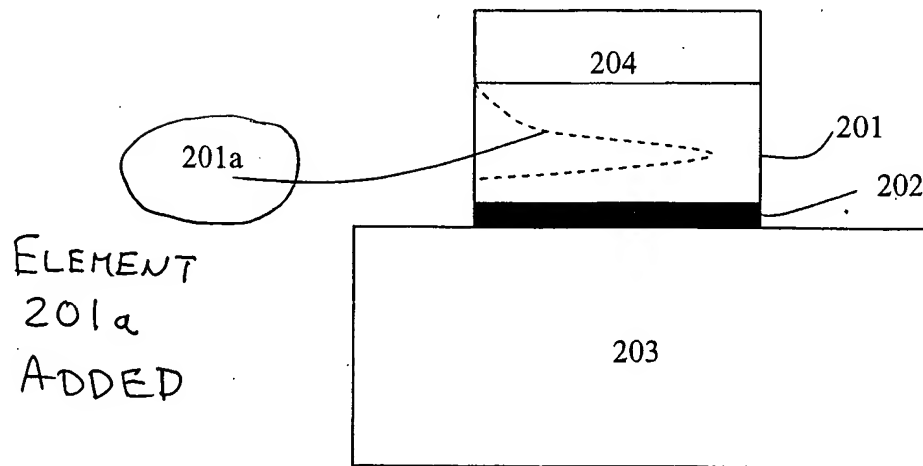


Fig. 2a

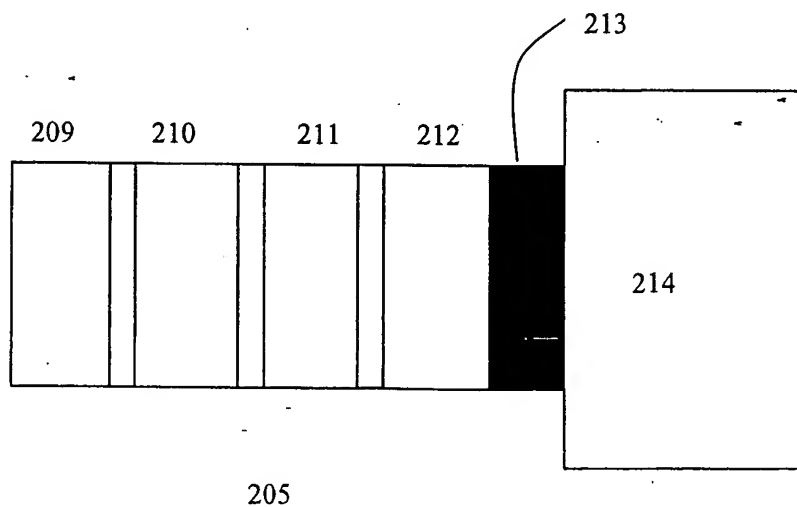


Fig. 2b